

**FEDERALLY
ENDANGERED**

Atlantic Salmon

(*Salmo salar*)



USFWS

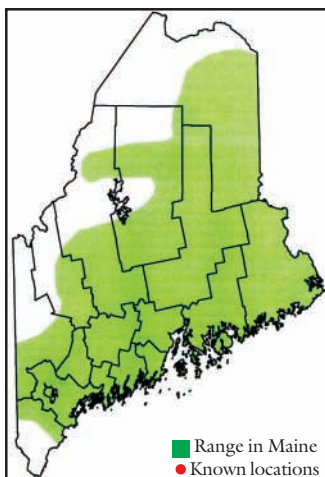
Description

The allure of fly fishing for Atlantic salmon and the anticipation of the first bright fish returning to spawning rivers each spring explain the devotion of anglers and conservationists to bringing back this remarkable fish. Sea-run Atlantic salmon are bright, silvery, large fish, over 30 inches in length and 7-15 pounds. They can reach much larger size (especially those that return several years to spawn), and the world record is 79 pounds. When at sea, they are bluish-brown on the back shading to white below. Dark spots are scattered over the upper half of the fish. They may resemble brown trout, but the tail is slightly forked rather than square, and there are no spots on the adipose fin (the small fin on the back just in front of the tail). In fresh water, Atlantic salmon turn dark gray to reddish brown and become darker colored and mottled. By fall, they are almost bronze-colored and have large reddish spots on the head and body. Juvenile salmon look very similar to trout but have a shorter mouth. The landlocked form (also known as ouananiche) is nearly identical in coloration to sea-run salmon, but is much smaller. The average landlocked salmon is about 20-25 inches long and weighs 3-5 pounds. Both are revered sport fish and are

known for their long, powerful runs and their willingness to take a fly or lure.

Range and Habitat

The Atlantic salmon's historic range encompassed the North Atlantic Ocean and its freshwater tributaries from Ungava Bay in Canada to Russia's White Sea. In eastern North America, they ranged as far south as Connecticut. In Maine,



Atlantic salmon were historically found in all major river systems and many of their tributaries with suitable spawning habitat. Today, Atlantic salmon have disappeared from much of their historic range including rivers in southern Maine and New England. In Maine they are still found in the Saco, lower Kennebec, lower Androscoggin, Sheepscot, Penobscot, Cove Brook, Passagassawakeag, Ducktrap, Narraguagus, Pleasant, Machias, East Machias, Dennys, and St. Croix Rivers. Freshwater habitat includes clear, coldwater streams and rivers having relatively unobstructed passage to the sea. Spawning habitat is characterized by coarse gravel or rubble bottom with suitable well-oxygenated, clean water of appropriate velocity and depth.

Life History and Ecology

Atlantic salmon have a complex life cycle. They are usually anadromous, migrating from the ocean to fresh water to reproduce in the river of their birth. Adults ascend rivers beginning in the spring. Migration peaks in June, but continues into the fall. Adults stop eating when they enter fresh water and live off fat reserves for up to one year. They seek coldwater areas to spend the summer and move to swift-running, gravelly tributaries to spawn in October and November. Unlike Pacific salmon species, they do not die after spawning and can return to the ocean and migrate back to spawn again.

The eggs are buried in gravel nests, called redds, and hatch in March and April. After hatching, the tiny larvae, or alevins, retain their yolk sacs and remain buried in the gravel for up to six weeks. After they lose their yolk sacs, the fry emerge to seek food and establish feeding territories. Young salmon, called parr, spend 2-3 years in their natal stream. When they are about six inches long, the salmon, now called smolts, undergo a physiological change to adapt to life in salt water. They become silvery in color and migrate to the ocean. Traveling thousands of miles to the North Atlantic near Greenland and Labrador, they remain in feeding grounds for 1-3 years before returning to their natal streams to reproduce. Salmon that return to

rivers after one year in the ocean are smaller and are called grilse. Salmon that survive spawning and return to the ocean to resume feeding are called kelts. Salmon have been known to spawn up to four times and may live to the ripe old age of 10. In the ocean, smolts feed on small shrimp and zooplankton, and adults feed on herring, sand lance, capelin, and shrimp.

Threats

Many factors influence the survival of Atlantic salmon populations. Dams impede fish migration, expose fish to increased predation by birds and anglers, alter water chemistry, increase temperature, and reduce flow. Beavers may intermittently prevent access to some spawning habitat. Land use adjacent to spawning rivers can be a source of siltation, water withdrawals for irrigation, and chemical contaminants – all of which can affect juvenile, adult, and smolt survival. Additional sources of mortality include predation by seals and cormorants, commercial fishing, recreational angling, and poaching. Introduced sport fish (smallmouth bass, pickerel, brown and rainbow trout) are predators on parr and smolts. Atlantic salmon aquaculture may be a source of genetic contamination, disease, and parasites. Global warming may affect surface temperatures in the ocean and trigger ecosystem-level changes, including loss of forage fish. Acid precipitation may affect young fish that are sensitive to changes in water chemistry. Biologists are investigating which of these factors may be limiting populations.

Conservation and Management

Atlantic salmon have been the focus of restoration efforts for over 150 years. Historic runs in the U.S. were about 500,000 fish; however, by the mid-1850s Atlantic salmon were extirpated from most of the rivers in southern New England and had declined noticeably throughout Maine. Hatcheries were established in Maine as early as the 1870s. The Craig Brook hatchery in Orland was established in 1890 for the purpose of stocking salmon. Since that time, approximately 96 million parr, smolts, and adult salmon have been stocked in Maine rivers and millions of dollars have been spent on salmon restoration.

The number of adults returning to Maine rivers has fluctuated, but remained at several thousand fish into the 1980s. From 0.5-15 percent (average 3-5 percent) of the smolts survive to return as spawning adults. In the mid-1990s, marine survival declined dramatically, causing salmon runs to plummet. The sport catch of wild salmon on the Downeast rivers dropped from several hundred per year to just a few dozen. Adult salmon returns declined statewide from 6,000-10,000 to 1,500-3,000 annually despite increased stocking efforts.

In 1999, the USFWS listed the Atlantic salmon as endangered in eight Maine rivers. The Atlantic salmon has no state listing status at this time.

Numerous recovery actions are being implemented. Sport fishing for sea-run salmon is now prohibited in all Maine waters. Habitat is being protected through management agreements with forest and blueberry landowners and

land acquisition along Downeast rivers. Research is being conducted to better determine factors limiting salmon. Both Canada and the U.S. have developed treaties with Greenland to reduce commercial harvest. Hatcheries are being managed to preserve the Downeast genetic stocks. Salmon aquaculturists are taking measures to eliminate escapes and reduce disease and parasite transmission to wild stocks. Weirs are installed on Downeast rivers to count returning fish and cull aquaculture escapees.

The prognosis for the salmon is uncertain. If current declines continue, endangered species listing may expand to other rivers in Maine. If limiting factors cannot be reversed, the salmon may be headed for extirpation.

Recommendations:

Management and recovery of salmon in Maine is the responsibility of the Maine Atlantic Salmon Commission.

- ✓ Prior to land development or forest harvesting near Atlantic salmon rivers, consult with biologists from the U.S. Fish and Wildlife Service, NOAA Fisheries, Maine Atlantic Salmon Commission, and MDIFW to assist with planning.
- ✓ Municipalities should follow Shoreland Zoning standards and maintain areas adjacent to salmon rivers in a low-density, rural setting. Identify these areas in comprehensive plans, and consider protecting waterways and a 250-foot upland buffer as Resource Protection Districts.
- ✓ Use voluntary agreements, conservation easements, conservation tax abatements and incentives, and acquisition to protect important habitat.
- ✓ To preserve water quality and river functions, maintain contiguous, forested riparian habitats at least 250 (preferably 600) feet from Atlantic salmon rivers.
- ✓ Avoid placing roads, houses, yards, and other developments within 250 feet of Atlantic salmon rivers.
- ✓ When projects are proposed within 250 feet of waterways providing habitat for endangered or threatened species, adhere to forestry Best Management Practices (handbook available from the Maine Forest Service, SHS #22, Augusta, ME 04333) and Maine Erosion and Sediment Control Recommendations (available from the Maine Department of Environmental Protection, SHS #17, Augusta, ME 04333).
- ✓ Avoid road or pipeline crossings or use of heavy equipment in streams or rivers.
- ✓ Avoid stream alteration projects (water withdrawals, dredging, rip-rap, channelization, dams) that would alter flow or remove natural stream features such as riffles and pools. Do not remove large woody debris, an important habitat component.
- ✓ Avoid the use of broad-spectrum pesticides within ¼ mile of waterways providing habitat for threatened and endangered species.
- ✓ Educate anglers to promptly return Atlantic salmon unharmed if they are caught accidentally.
- ✓ It is illegal to introduce fish species. Introductions could alter aquatic invertebrate communities and introduce new competitors, predators, or disease. 🐝